

WHAT IS CLAIMED IS:

1. A distributed interconnect comprising:
 - a first conductive transmission element disposed between a first and second terminal, said first conductive element having an impedance characteristic that increases from said first terminal to said second terminal, and
 - a second conductive transmission element disposed between a third and fourth terminal, said second conductive element having an impedance characteristic that increases from said third terminal to said fourth terminal, said first and second conductive transmission elements being positioned in parallel alignment with respect to each other; and
 - a plurality of conductive interconnect elements interconnecting said first and second transmission elements, said plurality of interconnect elements distributed along said first and second transmission elements and at least interconnecting said first terminal to said fourth terminal and interconnecting said second terminal to said third terminal; and
 - a first and second port, said first port connected to said first terminal and said second port connected to said third terminal.
2. The distributed interconnect according to claim 1, wherein said plurality of conductive interconnect elements includes at least one interconnect element evenly distributed between said first and second terminal and evenly distributed between said third and fourth terminal.
3. The distributed interconnect according to claim 1, wherein the impedance characteristic of said first and second conductive elements increases in one of a stepped, tapered and linear manner.
4. The distributed interconnect according to claim 1, said plurality of conductive interconnect elements positioned normal to said first and second transmission elements and in parallel with each other.
5. The distributed interconnect according to claim 4, said plurality of conductive interconnect elements evenly spaced from each other.
6. The distributed interconnect according to claim 1, said first conductive transmission element comprising a first metal trace disposed on a first surface and along a

first edge of a first substrate, and said second conductive transmission element comprising a second metal trace disposed on a second surface and along a second edge of a second substrate, said first edges and second edges laterally positioned next to each other forming a parallel gap therebetween.

7. The distributed interconnect according to claim 6, said plurality of conductive interconnect elements comprising equally spaced bondwires spanning the gap in a laterally parallel and equally space configuration.

8. The distributed interconnect according to claim 6, said first and second traces having one of a tapered and stepped shape.

9. The distributed interconnect according to claim 6, further comprising a bilateral trace electrically connected to an upper side of said first and second traces, said first and second traces having one of a dual stepped and dual tapered shape.

10. The distributed interconnect according to claim 1, said first conductive transmission element comprising a first metal trace disposed on an upper surface of a substrate, and said second conductive transmission element comprising a second metal trace disposed on a lower surface of said substrate, said first and second traces being partially positioned above one another in a parallel orientation.

11. The distributed interconnect according to claim 10, said plurality of conductive interconnect elements comprising a plurality of one of metal filled and edge plated vias disposed through said upper and lower surface of said substrate.

12. The distributed interconnect according to claim 10, said first and second metal traces having one of a tapered, stepped, dual tapered, and dual stepped configuration.

13. The distributed interconnect according to claim 1, said first conductive transmission element comprising a first lead connected to a device disposed internally in a semiconductor package, and said second conductive transmission element comprising a second lead externally disposed on a surface of a substrate.

14. The distributed interconnect according to claim 13, said plurality of conductive interconnect elements comprising a plurality of one of metal filled and edge plated vias disposed internally in the semiconductor package.

15. The distributed interconnect according to claim 14, further comprising a respective plurality of terminal leads exiting said package, said terminal leads having an

internal end and an external end, wherein said plurality of vias are bonded to each respective terminal lead, and said external leads are bonded to said second lead.

16. The distributed interconnect according to claim 15, said first and second lead having a pillar shape in which pads of equal area are provided for each interconnect element and pillar portions interconnect said pads, and wherein a width of said pillar portions are incrementally decreased from said first terminal to said second terminal and from said third terminal to said fourth terminal.

17. The distributed interconnect according to claim 15, said first and second lead having one of a tapered and stepped shape.

18. A method for interconnecting electrical components which minimizes coupling inductance and increases bandwidth, the method comprising:

disposing a first conductive transmission element between a first and second terminal, the first conductive element having an impedance characteristic that increases from the first terminal to the second terminal,

disposing a second conductive transmission element between a third and fourth terminal, the second conductive element having an impedance characteristic that increases from said third terminal to the fourth terminal, and

positioning the first and second conductive elements in parallel alignment with respect to each other;

interconnecting a plurality of conductive interconnect elements between the first and second transmission elements by,

distributing the plurality of interconnect elements along the first and second transmission elements,

at least interconnecting the first terminal to the fourth terminal, and

at least interconnecting the second terminal to the to the third terminal;

and

electrically connecting a first port to the first terminal, and

electrically connecting a second port to the third terminal.

19. The method according to claim 1, further comprising evenly distributing the plurality of conductive interconnect elements between the first and second terminal and between the third and fourth terminal.

20. The method according to claim 1, further comprising increasing the impedance characteristic of the first and second conductive elements in one of a stepped, tapered and linear manner.
21. The method according to claim 1, further comprising positioning the plurality of conductive interconnect elements normal to the first and second transmission elements and in a lateral and parallel orientation with respect to each other.
22. The method according to claim 1, further comprising,
forming the first conductive transmission element from a first metal trace,
disposing the first metal trace on a first surface and along a first edge of a first substrate,
forming the second conductive transmission element from a second metal trace,
disposing the second metal trace on a second surface and along a second edge of a second substrate, and
positioning the first edges and second edges laterally next to each other to form a parallel gap therebetween.
23. The method according to claim 22, further comprising utilizing equally spaced bondwires spanning the parallel gap as the plurality of conductive interconnect elements.
24. The method according to claim 22, further comprising providing first and second traces which have one of a tapered and stepped shape.
25. The method according to claim 22, further comprising electrically connecting a bilateral trace to an upper side of the first and second traces, wherein the first and second traces have one of a dual stepped and dual tapered shape.
26. The method according to claim 18, further comprising,
forming the first conductive transmission element from a first metal trace,
disposing the first metal trace on an upper surface of a substrate,
forming the second conductive transmission element from a second metal trace,
disposing the second metal trace on an upper surface of a substrate, and
positioning the first and second traces partially above one another in a parallel orientation.

27. The method according to claim 26, further comprising utilizing a plurality of one of metal filled and edge plated vias disposed through the upper and lower surface of the substrate as the plurality of conductive interconnect elements.
28. The method according to claim 26, further comprising providing first and second metal traces having one of a tapered, stepped, dual tapered, and dual stepped configuration.
29. The method according to claim 18, further comprising,
utilizing a first lead connected to a device disposed internally in a semiconductor package as the first conductive transmission element, and
utilizing a second lead externally disposed on a surface of a substrate as the second conductive transmission element.
30. The method according to claim 29, utilizing a plurality of one of metal filled and edge plated vias disposed internally in the semiconductor package as the plurality of conductive interconnect elements interconnecting the first and second conductive leads.
31. The method according to claim 30, further comprising,
utilizing a respective plurality of terminal leads for exiting the package, wherein the terminal leads have an internal end and an external end,
electrically connecting the at least one via to each respective terminal lead, and
electrically connecting the external leads to the second lead.
32. The method according to claim 31, further comprising providing a first and second lead having a stacked pillar shape in which pads of equal area are provided for each interconnect element and pillar portions interconnect the pads, and wherein a width of the pillar portions are incrementally decreased from said first terminal to said second terminal and from said third terminal to said fourth terminal.
33. The method according to claim 31, further comprising utilizing a first and second lead having one of a tapered and stepped shape.